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Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of claims:

1-39. (Canceled)

40. (New) A battery pack charge/discharge control apparatus for controlling a charge/discharge of a battery pack that is formed by combining a plurality of unit batteries of a secondary battery type, comprising:

a battery ECU, the battery ECU, comprising:

a charge/discharge restriction device for restricting the charge/discharge based on at least one of a capacity upper limit value and a capacity lower limit value of the unit batteries constituting the battery pack;

a remaining capacity detection device for detecting remaining capacities of unit batteries constituting the battery pack;

a control value computation device for computing a control state-of-charge value based on at least one of a minimum value and a maximum value of the detected remaining capacities;

a capacity difference computation device for computing, as a capacity difference, a remaining capacity difference between the remaining capacity of a first unit battery and the remaining capacity of a second unit battery among the unit batteries whose remaining capacities have been detected, the remaining capacity of the second unit battery being less than the remaining capacity of the first unit battery;

a storage device for storing a correlation between the capacity difference and an apparent state-of-charge value that is different from the control state-of-charge value;

an apparent state-of-charge value computation device for computing an apparent state-of-charge value with reference to the correlation based on the capacity difference; and

an apparent state-of-charge value adoption device for adopting the apparent state-of-charge value if the capacity difference is at least a predetermined capacity difference that is stored beforehand,

wherein the correlation is expressed by Mathematical Expression (1):

$$SOC = \frac{SOCmid - SOClow}{Qhigh - Qlow - Qd} \times (Qmin - Qlow) + SOClow \quad (1)$$

where SOC is the apparent state-of-charge value, and SOCmid is a control center value of the state-of-charge value, and SOClow is a lower limit set value of the state-of-charge value, and SOChigh is an upper limit set value of the state-of-charge value, and Qlow is a capacity value converted from SOClow, and Qhigh is a capacity value converted from SOChigh, and Qd is the capacity difference, and Qmin is the minimum remaining capacity, and Qmax is the maximum remaining capacity.

41. (New) A battery pack charge/discharge control apparatus for controlling a charge/discharge of a battery pack that is formed by combining a plurality of unit batteries of a secondary battery type, comprising:

a battery ECU, the battery ECU, comprising:

a charge/discharge restriction device for restricting the charge/discharge based on at least one of a capacity upper limit value and a capacity lower limit value of the unit batteries constituting the battery pack;

a remaining capacity detection device for detecting remaining capacities of unit batteries constituting the battery pack;

a control value computation device for computing a control state-of-charge value based on at least one of a minimum value and a maximum value of the detected remaining capacities;

a capacity difference computation device for computing, as a capacity difference, a remaining capacity difference between the remaining capacity of a first unit battery and the remaining capacity of a second unit battery among the unit batteries whose remaining capacities

have been detected, the remaining capacity of the second unit battery being less than the remaining capacity of the first unit battery;

a storage device for storing a correlation between the capacity difference and an apparent state-of-charge value that is different from the control state-of-charge value;

an apparent state-of-charge value computation device for computing an apparent state-of-charge value with reference to the correlation based on the capacity difference; and

an apparent state-of-charge value adoption device for adopting the apparent state-of-charge value if the capacity difference is at least a predetermined capacity difference that is stored beforehand,

wherein the correlation is expressed by Mathematical Expression (1):

$$SOC = \frac{SOCmid - SOClow}{Qhigh - Qlow - Qd} \times (Qmin - Qlow) + SOClow \quad (1)$$

where SOC is the apparent state-of-charge value, and SOCmid is a control center value of the state-of-charge value, and SOClow is a lower limit set value of the state-of-charge value, and SOChigh is an upper limit set value of the state-of-charge value, and Qlow is a capacity value converted from SOClow, and Qhigh is a capacity value converted from SOChigh, and Qd is the capacity difference, and Qmin is the minimum remaining capacity, and Qmax is the maximum remaining capacity,

wherein if in Mathematical Expression (1), the denominator on the right-hand side which is presented as Mathematical Expression (2) is at most a predetermined zero-cross reduction preventative value, the zero-cross reduction preventative value is adopted in place of the denominator expressed by Mathematical Expression (2):

$$Qhigh \geq Qlow \geq Qd \quad (2).$$

42. (New) A battery pack charge/discharge control apparatus for controlling a charge/discharge of a battery pack that is formed by combining a plurality of unit batteries of a secondary battery type, comprising:

a battery ECU, the battery ECU, comprising:

a charge/discharge restriction device for restricting the charge/discharge based on at least one of a capacity upper limit value and a capacity lower limit value of the unit batteries constituting the battery pack;

a remaining capacity detection device for detecting remaining capacities of unit batteries constituting the battery pack;

a control value computation device for computing a control state-of-charge value based on at least one of a minimum value and a maximum value of the detected remaining capacities;

a capacity difference computation device for computing, as a capacity difference, a remaining capacity difference between the remaining capacity of a first unit battery and the remaining capacity of a second unit battery among the unit batteries whose remaining capacities have been detected, the remaining capacity of the second unit battery being less than the remaining capacity of the first unit battery;

a storage device for storing a correlation between the capacity difference and an apparent state-of-charge value that is different from the control state-of-charge value;

an apparent state-of-charge value computation device for computing an apparent state-of-charge value with reference to the correlation based on the capacity difference; and

an apparent state-of-charge value adoption device for adopting the apparent state-of-charge value if the capacity difference is at least a predetermined capacity difference that is stored beforehand,

wherein the correlation is expressed by Mathematical Expression (1):

$$SOC = \frac{SOCmid - SOClow}{Qhigh - Qlow - Qd} \times (Qmin - Qlow) + SOClow \qquad (1)$$

where SOC is the apparent state-of-charge value, and SOCmid is a control center value of the state-of-charge value, and SOClow is a lower limit set value of the state-of-charge value, and SOChigh is an upper limit set value of the state-of-charge value, and Qlow is a capacity value converted from SOClow, and Qhigh is a capacity value converted from SOChigh, and Qd is the capacity difference, and Qmin is the minimum remaining capacity, and Qmax is the maximum remaining capacity,

wherein if in Mathematical Expression (1), SOC becomes greater than a maximum guard value, the maximum guard value is adopted in place of the term on the left-hand side in Mathematical Expression (1).

43. (New) A battery pack charge/discharge control apparatus for controlling a charge/discharge of a battery pack that is formed by combining a plurality of unit batteries of a secondary battery type, comprising:

a battery ECU, the battery ECU, comprising:

a charge/discharge restriction device for restricting the charge/discharge based on at least one of a capacity upper limit value and a capacity lower limit value of the unit batteries constituting the battery pack;

a remaining capacity detection device for detecting remaining capacities of unit batteries constituting the battery pack;

a control value computation device for computing a control state-of-charge value based on at least one of a minimum value and a maximum value of the detected remaining capacities;

a capacity difference computation device for computing, as a capacity difference, a remaining capacity difference between the remaining capacity of a first unit battery and the remaining capacity of a second unit battery among the unit batteries whose remaining capacities have been detected, the remaining capacity of the second unit battery being less than the remaining capacity of the first unit battery;

a storage device for storing a correlation between the capacity difference and an apparent state-of-charge value that is different from the control state-of-charge value;

an apparent state-of-charge value computation device for computing an apparent state-of-charge value with reference to the correlation based on the capacity difference; and

an apparent state-of-charge value adoption device for adopting the apparent state-of-charge value if the capacity difference is at least a predetermined capacity difference that is stored beforehand,

wherein the correlation is expressed by Mathematical Expression (1):

$$SOC = \frac{SOCmid - SOClow}{} \times (Qmin - Qlow) + SOClow \qquad (1)$$

$$Qhigh - Qlow - Qd$$

where SOC is the apparent state-of-charge value, and SOCmid is a control center value of the state-of-charge value, and SOClow is a lower limit set value of the state-of-charge value, and SOChigh is an upper limit set value of the state-of-charge value, and Qlow is a capacity value converted from SOClow, and Qhigh is a capacity value converted from SOChigh, and Qd is the capacity difference, and Qmin is the minimum remaining capacity, and Qmax is the maximum remaining capacity,

wherein if in Mathematical Expression (1), SOC becomes less than a minimum guard value, the minimum guard value is adopted in place of the term on the left-hand side in Mathematical Expression (1).

44. (New) A battery pack charge/discharge control apparatus for controlling a charge/discharge of a battery pack that is formed by combining a plurality of unit batteries of a secondary battery type, comprising:

a remaining capacity detector that detects remaining capacities of unit batteries constituting the battery pack; and

a controller that restricts the charge/discharge based on at least one of a capacity upper limit value and a capacity lower limit value of the unit batteries constituting the battery pack, computes a control state-of-charge value based on at least one of a minimum value and a maximum value of the detected remaining capacities, computes as a capacity difference, a remaining capacity difference between the remaining capacity of a first unit battery and the remaining capacity of a second unit battery among the unit batteries whose remaining capacities have been detected, the remaining capacity of the second unit battery being less than the remaining capacity of the first unit battery, stores a correlation between the capacity difference and an apparent state-of-charge value that is different from the control state-of-charge value, computes an apparent state-of-charge value with reference to the correlation based on the capacity difference, and the controller adopts the apparent state-of-charge value if the capacity difference is at least a predetermined capacity difference that is stored beforehand,

wherein the correlation is expressed by Mathematical Expression (1):

$$SOC = \frac{SOCmid - SOClow}{} \times (Qmin-Qlow) + SOClow \qquad (1)$$

$$Qhigh - Qlow - Qd$$

where SOC is the apparent state-of-charge value, and SOCmid is a control center value of the state-of-charge value, and SOClow is a lower limit set value of the state-of-charge value, and SOChigh is an upper limit set value of the state-of-charge value, and Qlow is a capacity value converted from SOClow, and Qhigh is a capacity value converted from SOChigh, and Qd is the capacity difference, and Qmin is the minimum remaining capacity, and Qmax is the maximum remaining capacity.

45. (New) A battery pack charge/discharge control apparatus for controlling a charge/discharge of a battery pack that is formed by combining a plurality of unit batteries of a secondary battery type, comprising:

a remaining capacity detector that detects remaining capacities of unit batteries constituting the battery pack; and

a controller that restricts the charge/discharge based on at least one of a capacity upper limit value and a capacity lower limit value of the unit batteries constituting the battery pack, computes a control state-of-charge value based on at least one of a minimum value and a maximum value of the detected remaining capacities, computes as a capacity difference, a remaining capacity difference between the remaining capacity of a first unit battery and the remaining capacity of a second unit battery among the unit batteries whose remaining capacities have been detected, the remaining capacity of the second unit battery being less than the remaining capacity of the first unit battery, stores a correlation between the capacity difference and an apparent state-of-charge value that is different from the control state-of-charge value, computes an apparent state-of-charge value with reference to the correlation based on the capacity difference, and the controller adopts the apparent state-of-charge value if the capacity difference is at least a predetermined capacity difference that is stored beforehand,

wherein the correlation is expressed by Mathematical Expression (1):

$$SOC = \frac{SOCmid - SOClow}{Qhigh - Qlow - Qd} \times (Qmin-Qlow) + SOClow \qquad (1)$$

where SOC is the apparent state-of-charge value, and SOCmid is a control center value of the state-of-charge value, and SOClow is a lower limit set value of the state-of-charge value, and SOChigh is an upper limit set value of the state-of-charge value, and Qlow is a capacity value converted from SOClow, and Qhigh is a capacity value converted from SOChigh, and Qd is the capacity difference, and Qmin is the minimum remaining capacity, and Qmax is the maximum remaining capacity

wherein if in Mathematical Expression (1), the denominator on the right-hand side which is presented as Mathematical Expression (2) is at most a predetermined zero-cross reduction preventative value (Q3), the zero-cross reduction preventative value is adopted in place of the denominator expressed by Mathematical Expression (2):

Qhigh - Qlow - Qd (2).

46. (New) A battery pack charge/discharge control apparatus for controlling a charge/discharge of a battery pack that is formed by combining a plurality of unit batteries of a secondary battery type, comprising:

a remaining capacity detector that detects remaining capacities of unit batteries constituting the battery pack; and

a controller that restricts the charge/discharge based on at least one of a capacity upper limit value and a capacity lower limit value of the unit batteries constituting the battery pack, computes a control state-of-charge value based on at least one of a minimum value and a maximum value of the detected remaining capacities, computes as a capacity difference, a remaining capacity difference between the remaining capacity of a first unit battery and the remaining capacity of a second unit battery among the unit batteries whose remaining capacities have been detected, the remaining capacity of the second unit battery being less than the remaining capacity of the first unit battery, stores a correlation between the capacity difference and an apparent state-of-charge value that is different from the control state-of-charge value, computes an apparent state-of-charge value with reference to the correlation based on the capacity difference, and the controller adopts the apparent state-of-charge value if the capacity difference is at least a predetermined capacity difference that is stored beforehand,

wherein the correlation is expressed by Mathematical Expression (1):

SOCmid – SOClow

$$SOC = \frac{}{Qhigh - Qlow - Qd} \times (Qmin - Qlow) + SOClow \quad (1)$$

where SOC is the apparent state-of-charge value, and SOCmid is a control center value of the state-of-charge value, and SOClow is a lower limit set value of the state-of-charge value, and SOChigh is an upper limit set value of the state-of-charge value, and Qlow is a capacity value converted from SOClow, and Qhigh is a capacity value converted from SOChigh, and Qd is the capacity difference, and Qmin is the minimum remaining capacity, and Qmax is the maximum remaining capacity,

wherein if in Mathematical Expression (1), SOC becomes greater than a maximum guard value, the maximum guard value is adopted in place of the term on the left-hand side in Mathematical Expression (1).

47. (New) A battery pack charge/discharge control apparatus for controlling a charge/discharge of a battery pack that is formed by combining a plurality of unit batteries of a secondary battery type, comprising:

a remaining capacity detector that detects remaining capacities of unit batteries constituting the battery pack; and

a controller that restricts the charge/discharge based on at least one of a capacity upper limit value and a capacity lower limit value of the unit batteries constituting the battery pack, computes a control state-of-charge value based on at least one of a minimum value and a maximum value of the detected remaining capacities, computes as a capacity difference, a remaining capacity difference between the remaining capacity of a first unit battery and the remaining capacity of a second unit battery among the unit batteries whose remaining capacities have been detected, the remaining capacity of the second unit battery being less than the remaining capacity of the first unit battery, stores a correlation between the capacity difference and an apparent state-of-charge value that is different from the control state-of-charge value, computes an apparent state-of-charge value with reference to the correlation based on the capacity difference, and the controller adopts the apparent state-of-charge value if the capacity difference is at least a predetermined capacity difference that is stored beforehand,

wherein the correlation is expressed by Mathematical Expression (1):

$$SOC = \frac{SOCmid - SOClow}{Qhigh - Qlow - Qd} \times (Qmin - Qlow) + SOClow \quad (1)$$

where SOC is the apparent state-of-charge value, and SOCmid is a control center value of the state-of-charge value, and SOClow is a lower limit set value of the state-of-charge value, and SOChigh is an upper limit set value of the state-of-charge value, and Qlow is a capacity value converted from SOClow, and Qhigh is a capacity value converted from SOChigh, and Qd is the capacity difference, and Qmin is the minimum remaining capacity, and Qmax is the maximum remaining capacity

wherein if in Mathematical Expression (1), SOC becomes less than a minimum guard value, the minimum guard value is adopted in place of the term on the left-hand side in Mathematical Expression (1).